

WHAT IS CLAIMED IS:

[c01] A method for making a diaryl carbonate, said method comprising:

contacting in a reaction mixture a phenolic precursor with carbon monoxide and oxygen in the presence of a carbonylation catalyst comprising palladium or a compound thereof, a co-catalyst, a base, a halide source, and a chemical additive for increasing the amount of diaryl carbonate produced per unit of the carbonylation catalyst, said chemical additive comprising a salt of magnesium or lithium, or a combination thereof, said chemical additive being present in an amount corresponding to at least 25 equivalents of lithium, magnesium, or a combination thereof relative to an amount of palladium present in the carbonylation catalyst.

[c02] The method according to claim 1 wherein said palladium catalyst is present as initially palladium acetylacetone.

[c03] A method according to claim 1 wherein the co-catalyst comprises copper and titanium.

[c04] The method according to Claim 3 wherein said co-catalyst comprises at least one compound selected from the group consisting of copper compounds, and titanium compounds.

[c05] A method according to claim 1 wherein said halide source comprises bromide.

[c06] A method according to claim 5 wherein said halide source comprises lithium bromide, magnesium bromide, or a combination thereof.

[c07] A method according to claim 1 wherein said reaction mixture further comprises at least one activating solvent.

[c08] A method according to claim 7 wherein said base is an inorganic base.

[c09] A method according to claim 7 wherein said activating solvent is selected from the group consisting of ethers, polyethers, nitriles, sulfones, amides, alkyl carbonates, and mixtures thereof.

[c10] A method according to claim 9 wherein said solvent is a polyether selected from the group consisting of diglyme, triglyme, tetraglyme, crown ethers, and mixtures thereof.

[c11] A method according to claim 10 wherein said base is lithium hydroxide, sodium hydroxide, potassium hydroxide, or mixtures thereof.

[c12] A method according to claim 11 wherein said base is lithium hydroxide.

[c13] The method according to claim 1 wherein said chemical additive is present in an amount corresponding to between 25 equivalents and about 950 equivalents of lithium, magnesium, or a combination thereof relative to the amount of palladium present.

[c14] The method according to claim 1 wherein said chemical additive comprises a halide or hydroxide of lithium.

[c15] The method according to claim 14 wherein said lithium is present in an amount corresponding to between about 100 equivalents and about 400 equivalents of lithium relative to the amount of palladium present.

[c16] The method according to claim 1 wherein said chemical additive comprises a halide or hydroxide of magnesium.

[c17] The method according to Claim 16 wherein said chemical additive is present in an amount corresponding to between 25 equivalents and about 150 equivalents of magnesium relative to the amount of palladium present.

[c18] A method according to claim 1 wherein said base is an organic base.

[c19] A method according to claim 18 wherein said organic base is selected from the group consisting of tertiary amines, quaternary ammonium hydroxides, quaternary phosphonium hydroxides, and mixtures thereof.

[c20] A method according to claim 19 wherein said organic base comprises tetramethylammonium hydroxide.

[c21] A method according to claim 18 wherein said organic base comprises at least one tertiary amine hydrate.

[c22] A method according to claim 18 wherein said organic base comprises at least one trialkylamine hydrate.

[c23] A method according to claim 22 wherein said trialkylamine hydrate is triethylamine hydrate.

[c24] A method according to claim 1 wherein said halide source comprises at least one alkali metal or alkaline earth metal halide.

[c25] A method according to claim 1 wherein said halide source comprises at least one quaternary ammonium or quaternary phosphonium halide.

[c26] A method according to claim 1 wherein said phenolic precursor is selected from the group consisting of phenol, p-cresol, o-cresol, m-cresol, 4-fluorophenol, bisphenol A, methyl salicylate, and mixtures thereof.

[c27] A method for making diphenyl carbonate, said method comprising:

contacting in a reaction mixture phenol with carbon monoxide and oxygen in the presence of a carbonylation catalyst comprising palladium or a compound thereof, a co-catalyst, a base, a halide source, and a chemical additive for increasing the amount of diaryl carbonate produced per unit of the carbonylation catalyst, said chemical additive comprising a salt of magnesium or lithium, or a combination thereof, said chemical additive being present in an amount corresponding

to at least 25 equivalents of lithium, magnesium, or a combination thereof relative to an amount of palladium present in the carbonylation catalyst.

[c28] A method for making diphenyl carbonate from phenol, said method comprising:

contacting phenol with a mixture of carbon monoxide and oxygen in the presence of a carbonylation catalyst comprising palladium or a compound thereof, a co-catalyst, a base, a halide source, and a chemical additive for increasing the amount of diphenyl carbonate produced per unit of the carbonylation catalyst, said chemical additive comprising a salt of magnesium or lithium, or a combination thereof, said chemical additive being present in an amount corresponding to at least 25 equivalents of lithium, magnesium, or a combination thereof relative to an amount of palladium present in the carbonylation catalyst, said cocatalyst being present in an amount corresponding to between about 13 and about 45 equivalents relative to the amount of palladium present in the carbonylation catalyst, said contacting being carried out at a pressure in a range between about 1000 and about 1600 psi and at a temperature between about 80 and about 110°C.